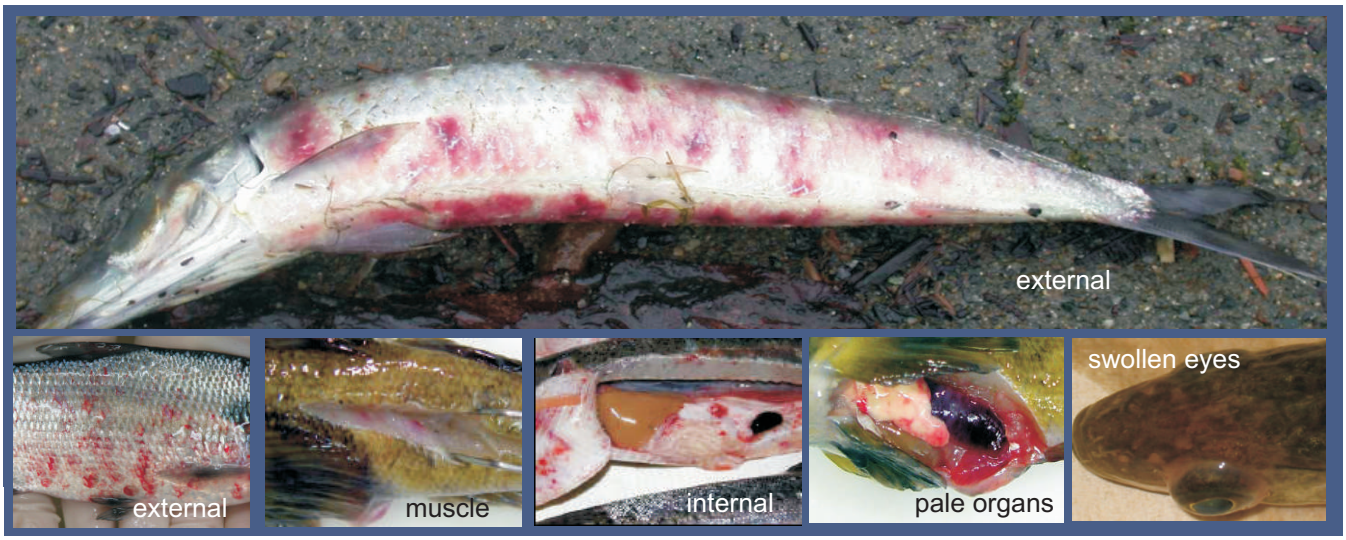
VHS Virus *Viral Hemorrhagic Septicemia*

Viral Hemorrhagic Septicemia (VHS) virus was diagnosed for the first time ever in the Great Lakes as the cause of huge fish kills in Lake Huron, Lake St Clair, Lake Erie, Lake Ontario and the St Lawrence River in 2005 and 2006. Thousands of muskies, walleye, lake whitefish, freshwater drum (sheepshead), yellow perch, gizzard shad, redhorse and round gobies died. Many Chinook, white bass, emerald shiners, smallmouth bass, bluegill, black crappie, burbot and northern pike were diseased but did not die in large numbers.

This is the first time a virus has affected so many different fish species from so many fish families in the Great Lakes. VHS virus is considered an invasive species (not native to the Great Lakes), but scientists are not sure how the virus arrived. It may have come in with migrating fish from the Atlantic Coast, or may have hitch-hiked in ballast water from ships.



Signs of VHS virus in fish include hemorrhages, both external on the skin and internal in the muscle and tissues, pale or swollen internal organs, and “pop-eye” (swollen eyes). Unfortunately, all these signs are not specific for VHS; fish with these lesions may be infected by other fish pathogens. Consequently, VHS infections must be confirmed by lab tests.

History of VHS virus

VHS was first known as a disease of farmed rainbow trout in Europe as early as the 1930's. However, it was not until 1963 that scientists confirmed the disease was caused by a virus.

In 1988-89, the virus was detected in wild herring and cod from the U.S. Pacific Coast, and also in salmon and steelhead that returned to Washington hatcheries to spawn. Since then, the virus has been confirmed in several species on the Atlantic Coast and in Japan.

Transmission

Infected fish shed the virus in their urine and reproductive fluids. Virus particles in the water infect gill tissue first, and then move to the internal organs and the blood vessels. The blood vessels become weak, causing hemorrhages in the internal organs, muscle and skin. Fish can also be infected when they eat an infected fish.

Fish that survive the infection will develop antibodies to the virus. Antibodies will protect the fish against new VHS virus infections for some time. However, the concentration of antibodies in the fish will drop over time and the fish may start shedding virus again. This may create a cycle of fish kills that occurs on a regular basis.

Photo credits: Dr Jim Winton (USGS, Seattle WA), Dr Mohamed Faisal (MSU, Lansing MI) and Dr Paul Bowser (Cornell, Ithaca NY)

***VHS* distribution (as of 2006)**

VHS has been diagnosed in

1. St Lawrence River
2. Lake Ontario
3. Lake Erie
4. Lake St Clair
5. Lake Huron

Based on the diagnosis of VHS virus in Chinook, walleye, and lake whitefish from Lake Huron in 2006, fisheries biologists believe the virus is probably already in Lake Michigan, and ballast discharged from ships may have moved the virus to port cities on Lake Superior.

In Fall 2006, the DNR, with the help of the US Fish and Wildlife Service La Crosse Fish Health Center and the Wisconsin Veterinary Diagnostic Lab, tested spawning Chinook and coho salmon, brown trout, lake whitefish, bloater chubs, and yellow perch from Lake Michigan for VHS virus. Spawning lake trout from Lake Superior were also tested. VHS virus was not detected in any species.

Environmental Factors

VHS virus can remain infective up to 14 days in water. The virus grows best in fish when water temperatures are 37-54°F. Most infected fish will die when water temperatures are 37- 41°F, and rarely die above 59 °F.

Stress is an important factor in VHS outbreaks. Stress suppresses the immune system, causing infected fish to become diseased. Stressors include spawning hormones, poor water quality, lack of food, or excessive handling of fish.

VHS IS NOT A HUMAN HEALTH CONCERN.

What is the Department of Natural Resources doing?

In Spring 2007, the DNR will test more wild fish from Lake Michigan and Lake Superior, including spawning steelhead, and will respond to fish kills.

The DNR will rigorously disinfect all fish eggs obtained from Great Lakes fish before they are brought into state hatcheries. This disinfection should destroy any virus inside the egg or on the egg surface.
DNR boats or gear used in the Great Lakes will be disinfected before they are used in other locations.

What can you do?

We are asking anglers and other water users voluntary cooperation to slow the spread of VHS virus from the Great Lakes to inland locations. Here's how you can help:

- Do not move live fish from one location to another.
- Do not empty bait buckets into lakes or rivers.
- Disinfect the outside and inside of your boat and your gear after using them in the Great Lakes: Mix 1/3 cup bleach in 5 gallons of water and brush/mop boat and trailer surfaces. Keep the surface wet for 5 minutes, then rinse with clean water. Disinfection should occur away from lakes and rivers because chlorine is toxic to aquatic life.
- Report fish kills to your local fisheries biologist or conservation warden

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